WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE
BUREAU OF BIOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF AGRICULTURE

Delay in issuing WILDLIFE REVIEW has been due mainly to a thorough process of revision of the mailing list. Material is ready for 3 numbers which it is planned to distribute in prompt succession.

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Bibliography: Wildlife management in relation to soil conservation

Gaines, Stanley H., et al. Bibliography on soil erosion and soil and water conservation, U. S. Dept. Agriculture Miscellaneous Publ. 312 (Supt. of Documents, Washington, D. C., 60 cents a copy), iv+651 pp., October (November) 1938.

The section on "Wildlife management as related to soil conservation" runs from page 544 to 559.

Biological Survey: Annual Report, 1937-38

Gabrielson, Ira N. Report of the Chief of the Bureau of Biological Survey, 1938 (Supt. of Documents, Washington, D. C., 10 cents a copy), 68 pp., 8 tables.

This is the only publication in which there is available a general account of the work of the Biological Survey. The material is arranged mostly, but not entirely, along Divisional lines under the following main headings: Research on wildlife status and management, Economic research on wildlife, Research in fur-animal conservation and utilization, Wildlife-disease control, Federal aid in wildlife restoration, Acquisition of lands for refuges, Restoration of wildlife habitat by the refuge program, Administration of national wildlife refuges, Administration of wildlife-conservation laws, Importation and other permits issued, Cooperative control of injurious animals, Control methods research, Wildlife conservation in Alaska.

Some points probably of especial interest to readers of WILDLIFE REVIEW are: Completion of a research laboratory at the Wichita Mountains (Oklahoma) Wildlife Refuge, and the beginning there of a full program of study of the relations of wildlife to forest and range; completion of a survey in all the States of game management as a supplementary farm enterprise; establishment of 5 new wildlife refuges and putting 17 under administration for the first time; organization of a division to put into effect legislation for Federal aid in wildlife restoration. Wildlife students will want to read for themselves, however, sections of the report in which they may be specially interested. It is fortunate that the pamphlet can be obtained from the Superintendent of Documents as the number of copies available for distribution by the Biological Survey is limited by law to 2,500 copies, a supply that is soon exhausted.

Biological Survey: Federal Aid Act

Day, Albert M. Operation of Federal Aid Act explained, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 27(4), July-August 1938, pp. 68-69.

Provisions of the Federal Aid to Wildlife Restoration Act explained. Types of projects likely to receive approval include: (1) The purchase of land for wildlife-rehabilitation purposes; (2) the development of land to make it more suitable for wild mammals and birds; and (3) research projects set up on a definite basis and directed to the solution of problems that stand in

the way of wildlife restoration. Examples of satisfactory projects are cited. Misconceptions of the intentions of the Biological Survey that have appeared are: That it wishes to restrict expenditure of funds to development of waterfowl areas; that it favors an exclusively refuge program; that regulations will be so strict that funds cannot be used, hence will revert to the use of the Federal government; and that the Bureau will insidiously attempt to take over the control and management of all resident game. Naturally these gossipy inventions are all disavowed.

Biological Surveys: Mammals of Commander Islands

Barabash-Nikiforov, I. Mammals of the Commander Islands and the surrounding sea, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas, $1.00 a copy), 19(4), Nov. 1938, pp. 423-429.

Description of natural conditions; annotated list of 18 forms mostly seal allies and cetaceans (exclusive of Delphinidae). Bibliography of 8 titles. Of most interest to wildlife managers for the account of the arctic fox. This includes information on general habits, food, moult, reproduction, dens, enemies, diseases, and parasites. The chief food is made up of marine forms, living and dead obtained along the shore, to which is added a considerable take (39 percent) of birds, a few insects, berries and other vegetation, and garbage.

Biological Surveys: Mammals of Labrador

Jackson, C. F. Notes on the mammals of southern Labrador, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas, $1.00 a copy), 19(4), Nov. 1938, pp. 429-434.

Review of literature, of which 9 titles are cited; annotated list of 18 forms.

Biological Surveys: Mammals of Vermont

Osgood, Frederick L., Jr. The mammals of Vermont, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas, $1.00 a copy), 19(4), Nov. 1938, pp. 435-441.

Annotated list of 61 forms; bibliography of 13 titles.

Conservation

Glover, Katherine. America begins again (McGraw-Hill Book Co., Inc. New York, N. Y., $2.75 a copy), 382 pp., illus., 1939.

The account of waste in our natural resources is described in the introduction by Stuart Chase as "making me pretty angry"; the book not only summarizes devastation of the country but tells what is now being done to make up for it. Chapter VI (pp. 203-229, 14 illus.) is devoted to wildlife. The original abundance of wildlife and its decline under persecution and destruction of environment are stated. Some money values of wildlife and specific

instances of usefulness are cited. The conservation movement is traced down to its most recent manifestations--the migratory waterfowl refuge, and Federal aid to the States, programs. The use of relief organizations and the cooperative effect of the work of various Federal bureaus is commented upon. Management, especially of farm game, and research are given attention and the encouraging results of restoration activities are sketched.

Conservation

Hamilton, W. J., Jr. Conservation of wildlife, Chapter III, pp. 261-345, figs. 154-193, in Gustafson, A. F., et al., Conservation in the United States (Comstock Publishing Co., 124 Roberts Place, Ithaca, N. Y., $3.00 a copy), 445 pp., frontispiece (cartoon) + 232 figs., 1939.

The book is a general work on conservation (soil, water, minerals, organisms) by 4 authors. Pertinent to WILDLIFE REVIEW are the chapters on Game and Fur Resources, and on Conservation of other Useful Wildlife; Hamilton's section includes also a chapter on fish and fisheries. In a work of so wide a scope treatment must be summary, hence striking facts and figures prevail. Values are given in estimates of yields and financial returns, but the esthetic side is by no means neglected. Accounts of the past abundance and general decline of wildlife inevitable to the review, as inevitably contain many superlative expressions. The present status of wildlife is realistically treated and the mechanism of conservation is described. Fur farming, game propagation and management, and the farmer's role in conservation also receive attention. Each of the chapters is accompanied by a set of questions.

Conservation

Murphy, Robert Cushman. Conservation II, Garden Club of America Bul. (1615 Twenty-first St., Washington, D. C.), 6(7), Jan. 1938, pp. 39-50; 6(8), March 1938, pp. 26-36.

Part of the text is of special interest to biologists; this abstract avoids, however, material substantially quoted from other sources. The author takes as an encouraging sign the tendency "to recognize the validity of information derived from the researches of naturalists," and urges that biologists be consulted in connection with the planning of all great landscape altering projects.

He refers to the primitive balanced condition of nature in which "Each organism, plant and animal, had its proper place in the scheme of things, and," he adds, "I want particularly to call your attention to the fact that predatory creatures, such as wolves, foxes, weasels, hawks, owls, and whatever else a large proportion of our modern population chooses to call 'vermin,' mostly existed in infinitely greater numbers than at present, and yet absolutely without prejudice to the welfare and increase of other species which we choose to call game." "I x x x have no sympathy with the point of view that lumps as 'vermin' all animals which sometimes kill other animals that man himself may want to kill. The raptorial birds have an indispensable function as members of a healthy fauna. The same is true of the carnivorous mammals. Both are part of the desirable balance of nature. Their blacklisting results largely from the

attitude of gamekeepers or fish-culturists, who have charge of helpless prey in pens or hatcheries where the density is quite unnatural. The shameful destruction of hawks and owls grows constantly with the spread of firearms, in spite of the accumulating testimony of science that most of them represent a net benefit both to crops and to game."

The author calls attention to the incorrigibility of hunters and editors of sporting journals in clinging to views on raptors based on slight experience, regardless of the findings of men who are using their time, talents, and education for no other purpose than to learn the truth.

Comment is included on the destructive and protective phases of American wildlife conservation and upon the promise shown by wildlife management through environmental improvement. Not only has the destruction of wildlife been great but "a great deal of it need never have occurred. We know now that the loss of wildlife, including flowers, birds, fish, fur-bearers and game, has been largely unnecessary. Many more of all these might still be thriving on land in economic use, and others could be accommodated on land not needed for economic use. One of the present educational jobs for the benefit of the entire populace is to induce landowners to keep the largest possible areas habitable for as many species of wildlife as they can." Game should be treated as a crop but to be successful in this, attention to maintenance of the stock should never be neglected because of greater interest in the harvest.

Conservation

Murphy, Robert Cushman. Conservation III, Garden Club of America Bul. (1615 Twenty-first St., Washington, D. C.), 6(12), Nov. 1938, pp. 34-48.

Nearly everyone agrees as to the desirability of conservation but few grasp the difficulties of the subject involving, as it does, almost infinite ecological relationships. "The one possible solution for a healthy condition is a recovery of the closest approximation of the original balance consistent with the exigencies of a human population that appears to be rapidly approaching its maximum density." The balance of nature is misunderstood, if not questioned, for lack of understanding of its fluctuating character. This is illustrated by discussion of the behavior of cyclic populations. The problem of wildlife management is adjustment to such natural rhythms. The difficulties of achieving adjustment are mostly human. The possible general establishment of tolerably balanced conditions in the United States is contrasted with the local maintenance of an artificial balance on British private estates. This, the writer feels, is so lopsided that it would not be tolerated in our country.

The author again comments on predaceous creatures, the presence of which in abundance is no threat to the continued prosperity of their prey, and supports the contention by various instances. Control operations interfere with the functioning of natural balance and experience has taught "that it is not so simple as we once thought to classify native animals into desirable and undesirable categories; even the so-called vermin have their place, and a natural balance of the original wildlife on uncultivated land is the soundest aim. x x x Local and needful control is wise control, but it offers no justification for bounty systems, trumped-up crow shoots, or the widespread distribution of poisoned bait."

Conservation: Bibliography

Hurley, Richard J. Key to the out-of-doors (H. W. Wilson Co., 950-72 University Ave., New York, N. Y., $2.50 a copy), 256 pp., 1938.

The subtitle is "A bibliography of nature books and materials." It includes references to publications issued or reissued since 1920 that apply chiefly to America, omitting technical, "ethical, philosophical, fictionized, and emotional elements except a few 'classics.'" Emphasis is on conservation and "hunting" material has been avoided. Pages devoted to citations on vertebrates extend from 105 to 163. There are references also to magazines, to sources of pictures and lantern slides and to devices and supplies, and to other nature bibliographies. Addresses of sources of film materials and of publishers fill pages 217 to 233.

Conservation: Bighorn

Carhart, Arthur H. Goodbye bighorn, Rocky Mountain Sportsman (1636 Champa St., Denver, Colo., 15 cents a copy), 1(3), Aug. 1938, pp. 12-13, 27-28, 4 photos, 1 map, 1 table. Digest in Conservation (919-17th St., Washington, D. C., 20 cents a copy), 4(5), Sept.-Oct. 1938, pp. 5-8.

The bighorn formerly used the foothills for winter range but is now largely restricted to higher elevations the year round. This unnatural and hazardous life together with competition and infections from sheep threaten its extermination. [That the bighorn succumbs to diseases of domesticated sheep is a plausible theory but that it does so to any significant extent seems not as yet, however, supported by satisfactory evidence.] A table giving numbers of bighorn and domestic sheep on the national forests of Colorado from 1914 to 1937 shows decrease in the former, increase in the latter, both considerable. The author's suggestion for a remedy is refuges for bighorns including adequate winter range from which livestock shall be excluded.

Conservation: Bighorn

Shantz, H. L. The bighorn and national forests, Conservation (919-17th St., N. W., Washington, D. C., 20 cents a copy), 5(1), Jan.-Feb. 1939, pp. 34-36.

Bighorns are steadily declining in numbers on the national forests, the proportion being 18 percent or more since 1921. Opinions as to the causes and remedies are discussed. Little seems to be definitely known and search for logical management procedure is advised. The article is a reply to one by Arthur H. Carhart, condensed in the September-October (4(5)) issue of Conservation, pp. 5-8. For abstract of that author's original paper see above.

Conservation: CCC in

Anon. The CCC and wildlife, Civilian Conservation Corps (Washington, D. C.), 16 pp., illus., 1 table, March 1939.

This well-illustrated pamphlet pictures somewhat luridly the primitive abundance of wildlife on the American continent, sketches its decline, and summarizes belatedly adopted protective measures. Despite efforts at conservation, "By 1933 the big-game situation was bad enough but could have been worse; the wildfowl situation was desperate." Drainage and desiccation added to the difficulties. In 1934 "there developed a concerted demand for federal action" to conserve the waterfowl. Some of the funds appropriated for submarginal land retirement and drought relief were allotted for wildlife restoration, enabling the Biological Survey to develop its refuge program.

The opportune organization of the Civilian Conservation Corps provided an agency that greatly extended the possibilities in water impoundment, establishment of food and cover plantings, collection of propagating material for current and future use, rescue of wild fowl affected by botulism, construction of nesting islands, and of protective fencing, roads, buildings, and other administrative facilities. In 5 years the CCC did such work on 46 refuges.

CCC work on national forests has included improvement of browse and cover conditions and winter feeding of wildlife. Cooperation with the Soil Conservation Service, the Tennessee Valley Authority, and the National Park Service and other Federal organizations also has been directed in part toward benefiting wildlife. The interests of the various agencies concerned were integrated so far as practicable. The CCC has had more than 2,000,000 men, mostly youths, in its camps, and due to their training, they represent a mass of informed public opinion on wildlife such as we have never before had. They are conscious of the value of wildlife as a national asset because they have helped to restore, preserve, and protect it. A table shows work of 40 classes done in 5 years by Biological Survey camps and by all camps.

Conservation: "Ducks Unlimited" in relation to

Lumley, Ellsworth D. Ducks unlimited, The Seattle Wren (L. Roy Hastings, 4442 48th Ave., S. W., Seattle, Wash.), 7(1), Jan. 1939, pp. 1-4.

The author refers to the campaign of Ducks Unlimited for funds in Washington State. Such funds with others collected are to be used to improve wild fowl breeding grounds in Canada. By such improvement, production of waterfowl is to be greatly increased and the duck shooters are promised longer hunting seasons, larger bag limits, and the removal of petty regulations. The author quotes authorities to show that the shortage is in ducks rather than in breeding grounds, there being not enough fowl to occupy the nesting areas already available. Lumley concludes that the activities of Ducks Unlimited are "a menace to the future welfare of the ducks." He quotes the head of the D. U. press bureau as opposing creation of a waterfowl refuge at Merrymeeting Bay, Maine, and promising cooperation with local interests in opposing the establishment of sanctuaries elsewhere. The author summarizes in part: "Only one conclusion can be drawn from a careful study of the facts. Ducks Unlimited is organized as a pressure group to defeat any conservation move in the United States which would save the ducks from hunters' guns."

Conservation: On an ecological basis

Lascelles, Tony. Save our wildlife! Now or never, Forest & Outdoors (610 Canada Cement Bldg., Montreal, Canada), 34(10), Oct. 1938, pp. 294, 296.

Do "game departments realize the existence of an association of life with its environment, the dovetailing x x x of every feature of the wilderness x x x the necessity of a scientific knowledge x x x the science of ecology." The inordinate destruction of red squirrels for their pelts is no aid to the recovery of the marten, nor does it help carnivorous fur-bearers in general to permit uncontrolled slaughter of varying hares. Destruction of beavers has damaged woodlands and the environment of other water-loving animals. Predators have a place in nature and their indiscriminate control is detrimental. The introduction of exotic game birds hampers the restoration of native species. Present hit-or-miss, uninformed methods should be abandoned in favor of those based on understanding of the interdependences of wildlife.

Conservation: Grouse, Sage

Girard, George L. Sage grouse and the State's conservation program, University of Idaho (Moscow) Bul. 33(22), Dec. 1938, pp. 66-67.

Notes on habits and food of the species in Wyoming and suggestions for its protection, including refuges, essential qualifications of which are mentioned. The sage grouse has alarmingly decreased in Idaho in a period of 20 years and is doomed to extinction unless greater consideration is given to it.

Conservation: House of Representatives Committee report

Anon. Report of the Select Committee on Conservation of Wildlife Resources, House of Representatives, 76th Congress, 1st Session, House Report No. 1 (House Office Bldg., Washington, D. C.), 29 pp., 1939.

This report contains a general statement on the value of wildlife. Contributions from the respective organizations on recent accomplishments, plans, and needs of the Biological Survey, Bureau of Fisheries, Forest Service, National Park Service, and Soil Conservation Service; remarks on related work of the Bureau of Agricultural Economics, Civilian Conservation Corps; discussion by the Committee of the migratory waterfowl situation, the Federal shooting regulations, Federal aid to States in wildlife restoration, stream pollution, protection of fur bearers, and the need for education in conservation together with recommendations of the Committee.

Conservation: Illinois

Frison, Theodore H. Advances in the renewable natural resources program of Illinois, Illinois State Acad. Sci. Trans., 31(1), Sept. 1938, pp. 19-34, 10 figs. Reprinted for the State Natural History Survey, Urbana.

Section headings indicating the nature of the contents are: Early and present attitudes toward natural resources, Background of the conservation and restoration program, Extent of renewable natural resources, Recent advances in

conservation, including game research and management, and Experimental wildlife areas. A map shows the location of forest, game, and fish development projects in Illinois.

Conservation: Mustelids

Marshall, William H. Notes on fur-bearers, University of Idaho (Moscow) Bul. 33(22), Dec. 1938, pp. 82-83, 1 table.

Relates to mustelids, giving their economic value, their estimated numbers on national forests in western States, the causes of their depletion (mainly trapping), and suggestions for their restoration and protection.

Conservation: Wildlife on farms

Gabrielson, Ira N. Farmer conservationists, Land Policy Review (Supt. of Documents, Washington, D. C., 5 cents a copy), 2(1), Jan.-Feb. 1939, pp. 12-15.

More than half of the land area of the United States is in private farms and including that, about 85 percent is devoted to agricultural uses. Hence the future of wildlife depends a great deal on the treatment accorded it by farmers. For the kinds of animals involved, all that governments can do toward their conservation is of minor importance. Farmers as a rule are favorably interested in wildlife and already have done a great deal to preserve it. Farmer-sportsman relationships are discussed; the farmer has been guided chiefly by social, not financial, considerations; and the outlook for any considerable money return in exchange for hunting privileges is not very promising. Real game management on farms usually is impracticable and artificial propagation too costly. The encouragement of natural reproduction by simple modifications of farm practices is feasible and farmers are interested in it. They like wildlife and wish to favor it. They constitute the largest and most important group of conservationists.

Conservation: Wildlife and other renewable resources

Taylor, Walter P. Conservation in Texas wildlife, Southwestern Sports Magazine (214-16 N. 6th St., Waco, Texas, 15 cents a copy), 2(3), Nov. 1938, pp. 14-15, 23, 3 photos.

All is not well with the so-called renewable natural resources. Detrimental influences and their results on wildlife are summarized in 10 significant indictments. The author believes that public sentiment is now receptive to conservation doctrine and that by management, a gratifying degree of restoration may be effected. Achievements are cited and cooperation with nature based on research recommended for their multiplication. All that needs to be done can be accomplished by the existing social organization but earnest attention is required and the program of conserving our natural resources must be solved if we are to survive.

Conservation: Wildlife in the Southwest

Ligon, J. Stokley. Wildlife and modern land-use policies in the Southwest, Cattleman (Coliseum Bldg., Stock Yards, Fort Worth, Texas), 25(6), Nov. 1938, pp. 45-48.

The writer's conviction, which he thinks is shared by many nowadays, is that crops and livestock should not be favored to the exclusion of wildlife. Although vegetation should be maintained at as near a normal stage as possible, commensurate with economic land use, the fact is that in the Southwest much of the range has been so denuded that it can be put to no profitable use. It must be restored and the author points out that, "Conditions favorable for sustained and most profitable livestock grazing supply the two major essentials--protective covering and source of foods--for game and insectivorous birds. Without restoration of forage where it has been seriously impaired or destroyed, or without conservative utilization of such forage where it does exist, neither livestock nor game can be expected continuously to thrive. x x x What is best for domestic animals is likewise best for wildlife." While the author recognizes that exotic game birds will live in environments unsuited to native species, he urges that the latter be protected and encouraged as much as possible. He relies on the cooperation of ranchmen because they have done much to save the wildlife of the Southwest, preserving it on their private holdings, while on public lands it was practically destroyed. Suggestions for game management in the range country are given.

Control: Bird and rodent damage to seedlings

Krauch, Hermann. Does screening of seed spots do more than protect the spots against rodents and birds?, Southwestern Forest and Range Expt. Sta. (Tucson, Ariz.), Note 49, 4 pp. (mimeographed), Dec. 1938.

1-year seedlings under screens continuously showed higher survival than those from which screens had been removed after a few months. The effects of screening will be further investigated but the suggestion to the abstracter is, if the operation pays for itself, it may be regarded as a horticultural practice and so lift part of the blame from the mammals and birds against which it is now used as a defense.

Control: Pine seed destruction by birds

Chapman, H. H. Birds and longleaf pine reproduction, Journ. Forestry (Mills Bldg., Washington, D.C., 50 cents a copy), 36(12), December 1938, pp. 1246-1247.

Refers to Burleigh's paper (see WILDLIFE REVIEW, No. 16, November 1938, pp. 19-20) which concludes that pine seeds in years of heavy yield are mostly eaten by the numerous birds they attract, and that consequently best survival can be expected from light yields. Chapman, however, states: "In the reviewer's experience in La Salle Parish, La., the heaviest reproduction was established in years of correspondingly heavy seed crops. The preference of blackbirds for freshly burned areas was demonstrated by the complete demudation of an experimental area in 1928, which had been burned before the seed fell.

This same area, in 1936, was successfully reproduced in a heavy seed year. The presence of an accumulation of three or more years' rough progressively inhibits germination, but this occurs plentifully in a rough composed of growth of one or two summers' grass. This rough evidently offers the necessary protection to the seeds against blackbirds. By burning the land over in the winter previous to seed fall, it is probable that bird damage can be successfully controlled."

Control: Predatory birds

Willett, G. Control of predatory birds, Modern Game Breeding and Hunting Club News (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa., 25 cents a copy), 9(2), Feb. 1939, pp. 12-13.

In view of the interest of different groups in birds, "Game breeders x x x should confine control measures to birds actually known to be doing damage." Discussion of hawks with suggestions as to recognition of the principal species. Briefer reference to owls, crows, ravens, jays, and the road-runner. Birds display individuality, and control should not be general but restricted to those that have acquired destructive habits.

Control: Rodents on the range

Bond, Richard M., and Adrey E. Borell. Rodents and soil conservation, Soil Conservation (Supt. of Documents, Washington, D. C., 10 cents a copy), 4(9), March 1939, pp. 220-223.

Opposed views on the relation of rodents to the range are summarized. "As usual the demand for action has preceded the provision for research." Investigation has been needed badly for years but the number of scientific reports on just what rodents do to land may be numbered on the fingers of one hand. The more profound investigations have turned up bits of information favorable to the rodents; these are cited. Van Dersal's conclusions from examination of the literature on the relation of rodents to soils are quoted. (These may be found in WILDLIFE REVIEW, No. 9, July 1937, p. 11.) The relation of rodents to earthen water-controlling structures is conflicting. In fact what seems most clear is that these animals do both good and harm and that much study is needed of their relations to soil and water conservation. Suggestions are given as to the subjects and methods of such investigations. Until the work is actually effected, "caution in the expenditure of soil-conservation funds for rodent control is definitely indicated."

Control: Roving dogs

Egbert, George L. The coyote and his bad name, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 8(7), March 1939, p. 5.

A special effort to reduce the number of roving dogs in Iosco County, Mich., resulted in the elimination of more than 80 animals and in addition greatly improved collection of dog license fees. Since this purge there has been a marked decline in depredations on sheep, which, formerly, were attributed almost entirely to coyotes. The conclusion is "that snap judgments should not be made for or against any species of predatory wildlife, for while [the coyote

is] known to attack both deer and sheep at times, it is also known that its marauding forays are occasionally exceeded in ferocity and destructiveness by the hunting dog, which sometimes escapes both blame and punishment."

Control: Squirrel damage to tree tags

Stevenson, Donald D. Squirrel damage to sample plot tags, Journ. Forestry (Mills Bldg., Washington, D. C., 50 cents a copy), 36(12), Dec. 1938, pp. 1242-1243.

As many as one-quarter of the aluminum tags used to mark trees in permanent plantations in central Pennsylvania have been destroyed by squirrels. The author recommends painting of the numbers on a blaze wherever the squirrel population is high.

Cycles: Arctic animals

Chitty, Dennis. Canadian Arctic wild life enquiry, 1936-37, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N. W. 1, England, 20 shillings a copy), 7(2), Nov. 1938, pp. 381-394, 3 figs. (maps), 2 tables.

The second report on a questionnaire inquiry into population trends of lemmings, arctic fox, and snowy owl. "In the Eastern Arctic there was considerable increase reported in arctic foxes, especially on Baffin Island and the coast of Northern Quebec. Lemmings and snowy owls, which had begun to recover from scarcity in the previous season, showed further well-marked increase in the same region, and also to some extent elsewhere. In the Western Arctic there were very few signs of such recovery among any of the species studied." The basic data is both tabulated and mapped. Notes on disease among sledge dogs also are quoted and summarized.

Cycles: Grouse

Erickson, A. B. Grouse observations, The Flicker (427 Eighth Ave., S. E., Minneapolis, Minn.), 10(3-4), Dec. 1938, p. 14.

Observations in St. Croix Park, Pine County, Minn., indicate that the die-off in ruffed and sharp-tailed grouse occurred in the fall and winter of 1935-36. Notes are given on populations for 1935, 1936, and 1937.

Cycles: Northern animals

Dymond, J. R. The study of animal populations, Rod and Gun in Canada (1224 St. Catherine St., West, Montreal, Canada, 10 cents a copy), 40(10), March 1939, pp. 17-18, 26-27, 2 photos.

Rather popular discussion of cyclic phenomena in the snowshoe hare and lemmings and dependent predators. References also to fluctuations in ruffed and sharp-tailed grouse. The point is emphasized that peaks of abundance do not always occur in the same year in all parts of the country--a happening that throws considerable doubt on the sun-spot theory. The writer makes some salu-

tary remarks also on the dependency of predator numbers on the populations of their prey. "A point worth emphasizing in connection with the fluctuations of hare numbers is that it is not the 'enemies' of hares which cause their scarcity; the reproductive capacity of hares and other animals is adequate to maintain and even increase their numbers in the presence of the predators which normally prey on them. It is the prey, in this case the hares, which determine the numbers of their predators. Predators do affect to some extent the numbers of their prey but the initiative lies with the prey."

Much the same material is printed in Royal Ontario Museum of Zoology (Toronto, Canada) Bul. 8, November 1938, pp. 11-16.

Cycles: Snowshoe hare

Philip, Cornelius B. A parasitological reconnaissance in Alaska with particular reference to varying hares. I. Some biological considerations, Journ. Mammalogy (Wm. B. Davis, College Station, Texas, $1.00 a copy), 20(1), Feb. 1939, pp. 82-86, 1 table.

Biological data are recorded in the text as well as summarized in a table relative to sex, number of young, and parasites of 172 hares. The cyclic die-off does not necessarily occur simultaneously over the whole territory. Tularemia was identified in the animals but possible vectors of this disease do not appear numerous enough to enable it to be an important factor in hare decimation. Bibliography of 12 titles.

Destruction: Highway

Scott, Thos. G. Wildlife mortality on Iowa highways, American Midland Naturalist (Notre Dame, Ind., $1.00 a copy), 20(3), Nov. 1938, pp. 527-539, 5 tables.

Casualties and the mileage record for each were noted on improved rural roads during all months in 43 counties. The number was 1,239 in 2,944 miles or approximately .429 per mile. Total for the State on roads of the type inspected probably exceed 160,000. Factors influencing mortality are discussed, and the data gathered for the paper are presented in annotated lists and distributed in the tables.

Destruction: Highway

Simmons, James R. Feathers and fur on the turnpike, Christopher Publishing House (Boston, Mass., $1.75 a copy), 148 pp., 10 pls., 3 figs., 4 tables, 1938.

1. A study of wildlife casualties on the highway, pp. 9-10, 13-93. Chiefly anecdotal account of animals and experiences with them connected with the author's 10-year study undertaken partially to salvage highway-killed wildlife for scientific purposes. Tables list the specimens noted, classified by species and so far as practicable, as immature, male, and female--groups killed in frequency in the order given; also in similar detail the animals killed on 2 particular stretches of road in a year; the results tally very closely, being 8.5 and 8.0 victims per mile per year and .023 and .0219 per

mile per day. At that rate total destruction in the United States would be about 6 million vertebrates [this word misspelled throughout the book]. The casualty curve for these roads is rather steep-sided and reaches its apex in August. In the tabulation of all animals recovered, the following were killed in greatest numbers: Robin 375, English sparrow, 351, cottontail, 337, field sparrow, 296, and skunk, 222. There is a partial review of contemporary studies of highway mortality, a discussion of why animals come to the road, and suggestions as to what can be done to reduce destruction. Among these are providing grit and dust areas near, but not too near, roads; refraining from throwing remains of lunches and other edible refuse on or along highways; erecting signs calling attention to deer crossings, installing escape-ways, and undertaking corrective education. A chapter is devoted to cats, many of which are killed by automobiles; his remarks on their food habits are not so condemnatory as those prevalent among sportsmen.

Destruction: Winter killing

Errington, Paul L. The comparative ability of the bobwhite and the ring-necked pheasant to withstand cold and hunger, Wilson Bul. (University of Michigan, Ann Arbor, Mich., 60 cents a copy), 51(1), March 1939, pp. 22-37, 7 tables.

Summary of observational and experimental data. Bibliography of 20 titles. From the author's discussion: "It is apparent from the existing experimental and observational data that winter food crises do not have the malignant significance to wintering pheasants that they may have to bob-whites in north-central states. Not only does the ring-necked pheasant have superior ability to withstand cold when in poor flesh, but it is much less likely to become emaciated from hunger in the first place. Its loss rates are less rapid in proportion to its weight even while starving, and there is evidence that it can retard starvation during crises by feeding upon buds and other herbaceous foods that are not of comparable nutritive value to bobwhite x x x The pheasant's greater strength is of distinct advantage to it if the food is covered by snow or ice; and its greater mobility and comparative independence of brushy cover takes much of the pinch out of many local food shortages. Furthermore, the facility with which it regains lost weight when opportunity permits is probably a major reason for the fewness of authentic records of pheasant starvation in the field.

"I am by no means advocating the replacement of the native northern bob-white by the exotic ring-necked pheasant. There are biological, economic, and esthetic angles to questions pertaining to the desirability of encouraging pheasants and bob-whites that are not here considered; but, whatever may be the ramifications or controversial aspects of these, it should be useful to conservation workers merely to have a clearer idea of how much better the pheasant is adapted to forage for a living when the ground is covered with snow and to appreciate more the significance of a uniformly reliable food supply to wintering bob-white populations."

Diseases and Parasites: Alaskan vertebrate parasites

Philip, Cornelius B. A parasitological reconnaissance in Alaska with particular reference to varying hares. II. Parasitological data, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(6), Dec. 1938, pp. 483-488, 2 tables.

Tapeworms, nematodes, ticks, fleas, and mites tabulated according to localities and numbers of specimens. Notes on pathology of hares examined. Both endo- and ecto-parasites collected from 9 other species of mammals and 6 of birds are listed. Bibliography of 6 titles.

Diseases and Parasites: Of American mice

Erickson, Arnold B. Parasites of some Minnesota Cricetidae and Zapodidae, and a host catalogue of helminth parasites of native American mice, American Midland Naturalist (Notre Dame, Ind., $1.00 a copy), 20(3), Nov. 1938, pp. 575-589, 18 figs.

Summary of the history of study of American helminth parasites of mice, report on Minnesota studies including descriptions of 2 new species from Zapus and 3 from Peromyscus; host catalogue as noted in title; bibliography of 21 titles.

Diseases and Parasites: Avian tuberculosis

Feldman, Wm. H. Avian tuberculosis infections (Williams & Wilkins Co., Baltimore, Md., $7.00 a copy), 483 pp., 109 figs., 1938.

An introductory sketch by another author refers to this book as a monograph and it seems well to deserve that distinction. It contains 13 chapters of which two are of special interest to the student of wildlife diseases. These discuss the pathogenicity of avian tuberculosis bacilli for fowl other than chickens (including wild birds) and for certain mammals other than man. The organism seems to be capable of infecting all species of birds, but is infrequently reported. Various mammals are, or can be, infected but the group shows considerable resistance to this disease. Like other chapters of the book, those particularly cited are accompanied by specific bibliographies.

Diseases and Parasites: Botulism

Hall, I. C., and G. W. Stiles. An outbreak of botulism in captive mink on a fur farm in Colorado, Jour. Bacteriology (Williams & Wilkins Co., Baltimore, Md.), 36(3), March 1938, p. 282.

The death of 146 of 148 mink on a fur farm near Denver is shown to have been caused by the toxin of Bacillus botulinus type A. This appears to be the first recorded instance of naturally occurring botulism in mink or other fur-bearing animals. (Courtesy Experiment Station Record)

Diseases and Parasites: Botulism, lead poisoning

Fredine, Gordon, and J. Frederick Bell. Ducks get sick too, Minnesota Conservationist (Dept. of Conservation, St. Paul, Minn., 15 cents a copy), 63, Dec. 1938, pp. 16-17, 24, 34, 4 photos.

Popular account of botulism and lead poisoning in Minnesota. More than 3,000 ducks perished from the former malady at Lake Shaokotan in the early fall of 1938. A variety of measures (described) to keep wild fowl away from the danger area apparently were highly successful. Out of 914 sick ducks treated, 774 recovered and were released in uninfected lakes. In 1936 ducks frequented a small open hole in the ice at Bear Lake where they obtained enough lead pellets to cause the death of several hundreds of them from lead poisoning. Treatment was unavailing. The possibility of using non-toxic shot is discussed.

Diseases and Parasites: Chastek paralysis

Green, R. G. Chastek paralysis, Amer. Fur Breeder (St. Peter, Minn., 15 cents a copy), 11(1), Jan. 1938, pp. 4, 6, 8.

A type of paralysis which has frequently been observed among foxes in recent years is described. This disorder is apparently due to a deficiency of vitamin B_1 in the diet and has generally occurred when the diet contained a rather high percentage of fresh fish. A common type of ration containing about 7 percent of fresh fish and 7 percent of liver was fed with good results, while a similar type of ration containing 18 percent of fresh fish and 2 percent of liver resulted in a severe outbreak of the paralysis. This disorder has not been observed when cooked fish were fed. (Courtesy Experiment Station Record)

Diseases and Parasites: Cochlosoma

Travis, Bernard V. A synopsis of the flagellate genus Cochlosoma Kotlan, with the description of two new species, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(4), August 1938, pp. 343-351, 11 figs.

History; generic diagnosis; systematic position; economic status. Description, measurements, and illustrations of 3 species: C. anatis Kotlan from various species of ducks; C. picae n. sp. from the American magpie (Idaho); and C. turdi n. sp. from the robin (Iowa). Comparative notes, summary, and bibliography of 4 titles.

Diseases and Parasites: Dracunculus

Brackett, Sterling. Description and life history of the nematode Dracunculus opidensis n. sp., with a redescription of the genus, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(4), Aug. 1938, pp. 353-361, 8 figs.

From garter snakes, Michigan; description, measurements, illustrations, comparative remarks, life cycle. Emendation of the generic diagnosis. Bibliography of 6 titles.

Diseases and Parasites: Eimeria

Boughton, Donald C., and Joseph J. Volk. Avian hosts of Eimerian coccidia, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass., 75 cents a copy), 9(3), July 1938, pp. 139-153, 1 fig.

Eimerian coccidiosis is described and its occurrence among birds discussed. There is a host list giving the species of Eimeria known from various birds (37 spp.), a descriptive catalog of the parasites (34 spp.), and a 2-page bibliography.

Diseases and Parasites: Encephalomyelitis

Tyzzer, Ernest E., Andrew W. Sellards, and Byron L. Bennett. The occurrence in nature of "equine encephalomyelitis" in the ring-necked pheasant, Science (Lancaster, Pa., 15 cents a copy), 88(2291), Nov. 25, 1938, pp. 505-506.

This disease identified by laboratory procedure in pheasants from Connecticut. The susceptibility of other birds both wild and domesticated is noted. Symptoms and lesions are described. The authors consider the adjective "equine" objectionable for this evidently widespread disorder is of no greater prevalence in horses, perhaps, than in other animals. It is suggested that the disease may be spread by migratory birds.

Diseases and Parasites: Enteritis in raccoon

McDermid, A. M. Infectious gastro-enteritis in raccoon, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 4(3), March 1939, pp. 21-22.

An acute virus disease observed on 5 fur farms in Wisconsin. Symptoms are described. In most cases the primary infection seemed traceable to cats. Good results have been obtained from treatment with commercial feline enteritis serum. Symptomatic treatment also is described.

Diseases and Parasites: Flukes in ducks

Beaudette, F. R. Flukes in the respiratory tract of ducks, Journ. Amer. Veterinary Assoc. (221 N. La Salle St., Chicago, Ill., 40 cents a copy), N.S. 47(1), Jan. 1939, p. 44.

Records of flukes, acanthocephalids, and nematodes from mallards in New Jersey. The flukes are identified as Typhlocoelum cymbium, a species previously recorded from the pintail and the pied-billed grebe.

Diseases and Parasites: Flukes in turtles

Byrd, Elon E. Studies on the blood flukes of the family Spirorchidae. Part II. Revision of the family and description of new species, Reelfoot Lake Biol. Sta. Rep. (Tennessee Academy of Science, Nashville, Tenn.), 3, Jan. 1939, pp. 116-161, 4 pls., 1 fig.

Historical and systematic review with keys and descriptions of genera and species (9 new) of this family of turtle parasites. The figure is a phylogenetic "tree" and the plates are of drawings illustrating the new species. Bibliography of 24 titles.

Diseases and Parasites: Fowl paralysis (?) in pheasants

Junghorr, Erwin. Neurolymphomatosis phasianorum, Journ. Amer. Veterinary Assoc. (221 N. La Salle St., Chicago, Ill., 40 cents a copy), N.S. 47(1), Jan. 1939, pp. 49-52, 5 figs.

Outbreak of a disease in 4-months' old pheasants (Phasianus torquatus) that resembles fowl paralysis. Symptoms discussed and lesions described and illustrated.

Diseases and Parasites: Isospora boughtoni n. sp.

Volk, Joseph J. Isospora boughtoni n. sp. from the American opossum, Didelphis virginiana, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(6), Dec. 1938, pp. 547-548, 1 fig.

Coccidian from Georgia described and illustrated.

Diseases and Parasites: Leucocytozoon synonymy

Herman, Carlton M. Leucocytozoon anatis Wickware, a synonym for L. simondi Mathis and Leger, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(5), Oct. 1938, pp. 472-473.

Comparative notes to support the synonymy.

Diseases and Parasites: Liver fluke of deer

Whitlock, S. C., and Carl Gower. Deer liver fluke common in the Upper Peninsula, Michigan Conservation (Dept. of Conservation, Lansing, Mich.), 8(2), Oct. 1938, p. 8, 2 photos.

Description and illustration of the fluke and of lesions caused by it. Alternate hosts are snails; the immature flukes encyst on water plants which may be eaten by deer; the young flukes thus swallowed then may mature and lay eggs to perpetuate the species.

Diseases and Parasites: Malaria

Herman, C. M. Epidemiology of malaria in eastern red-wings (Agelaius p. phoeniceus), Amer. Jour. Hyg. (Prince and Lemon Sts., Lancaster, Pa.), 28(2), Sept. 1938, pp. 232-243.

In the course of a study made of malaria in the eastern redwing at the Austin Ornithological Research Station on Cape Cod, Mass., during the summer of 1937, but 1 of 53 adult birds examined by blood smears was found infected. "When blood from 48 of these adults was subinoculated into clean canaries, 19 cases of Plasmodium circumflexum (40 percent) and 10 cases of P. cathemerium

(20 percent) were disclosed, a total prevalence of 60 percent. Parasites were observed in blood smears from only 2 of 86 young examined. Blood from 38 of these young was subinoculated into clean canaries, of which 11 subsequently showed parasites, an incidence of about 28 percent. All Plasmodium infections observed in young redwings were P. circumflexum x x x The evidence presented suggests that the young redwings did not obtain their infections while on the nest. A few obtained infections shortly after leaving the nest, but the greatest incidence was in birds about 1 mo. old. x x x The lack of infection with P. cathemerium in the young may be due to the fact that P. cathemerium produces a low grade of infection in redwings as compared with P. circumflexum." (Courtesy Experiment Station Record)

Diseases and Parasites: Mesocercaria

Olivier, Louis, and Theron O. Odlaug. Mesocercaria intermedia n. sp. (Trematoda: Strigeata) with a note on its further development, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(4), Aug. 1938, pp. 369-374, 1 fig.

History of the genus, description and figure of the new species from frogs and snakes (Michigan). Notes on life history; detailed description of excretory system and comparison with those of other mesocercariae. Bibliography of 7 titles.

Diseases and Parasites: Minnesota investigations

Green, R. G., et al. Minnesota Wildlife Disease Investigation (Dept. of Bacteriology, University of Minnesota, Minneapolis), July 1938, pp. 52-59, graphs 1-2, tables 22-24; Aug. 1938, pp. 60-67, tables 25-29; Sept. 1938, pp. 68-73, tables 30-33; Oct. 1938, pp. 74-79, tables 34-37, 2 figs.; mimeographed.

July. Discussion of weights of snowshoe hares in health and disease; those dying from shock disease averaged 16 percent loss in weight than "normal" animals. Sex ratio in the hares is discussed; the evidence indicates that shock disease does not affect one sex more than the other. Pathological reports on miscellaneous specimens relate to blue geese, robin, mallard, and muskrat; there are also necropsy findings for 5 snowshoe hares.

August. Data collected on cottontail rabbits during the snowshoe hare investigation indicate that this species undergoes cyclic fluctuations roughly synchronous with those of the hare. Another outbreak of botulism among waterfowl occurred in 1938; pathological reports are given on 9 specimens representing 5 species, all of which were found to have died from the disease. According to autopsies that are briefed, 7 quail from a State game farm died from ulcerative enteritis. Miscellaneous pathology notes are given for a caribou, 4 snowshoe hares, and a gray squirrel.

September. There is a note on the nature of viruses corroborating a suggestion made by Dr. Green in Science in 1935. A method of "Rapid diagnosis of canine distemper" by R. G. Green and C. A. Evans is reported; examination of smears of epithelial cells from the bladder enables diagnosis within an hour.

A second article on botulism presents the results of autopsies of 8 positive cases, representing 6 species, and emphasizes the dependence of the bacillus upon decomposed organic (especially plant) matter. Pathological reports relate to 4 snowshoe hares, a flicker, and a ruffed grouse.

October. Contains a special article on grouse populations abstracted elsewhere (Ecology: Census methods, p. 26) and the usual pathological reports, relating this time to 5 snowshoe hares, and one each of pintail, blue-winged teal, pheasant, and blue jay.

Diseases and Parasites: Papillomatosis in deer

Chaddock, T. T. Epithelial papillomas reported in deer, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 4(2), Feb. 1939, pp. 31-32, 1 photo.

Description and illustration of extensive benign tumors. The animal, which was shot, "was in very good condition."

Diseases and Parasites: Passer domesticus carrying poultry parasites

Hoyle, Wm. L. Transmission of poultry parasites by birds with special reference to the "English" or house sparrow and chickens, Kansas Acad. Sci. (Topeka) Trans. 41, 1938, pp. 379-384.

Review of published reports of the occurrence of ectoparasites of poultry on Passer domesticus. Statement of the author's findings from examination of these birds and their nests; both classes of material yielded chicken parasites. In experiments, the lice were transmitted from chicken to sparrow through dust baths, lived as long as 9 days on the sparrow and reproduced there. "The evidence at hand indicates that the common 'English' or house sparrow is a source for transmission of poultry parasites such as mites, lice, and sticktight fleas from an infested flock of chickens to one noninfested."

Diseases and Parasites: Perosis

Bess, C. C. Occurrence of slip tendon in quail in close confinement, Game Breeder & Sportsman (205 E. 42nd St., New York, N. Y., 20 cents a copy), 42(8), August 1938, p. 128.

The occurrence of perosis in both the bobwhite quail and Oregon mountain quail held in close confinement is noted. The addition of a small amount of manganese or 15 percent of rice polish, or both, to a perosis-producing basal ration prevented the occurrence of this disorder. (Courtesy Experiment Station Record)

Diseases and Parasites: Porsimmon wilt

Beattie, R. Kent, and Bowen S. Crandall. Disease attacks the persimmon, American Forests (919 Seventeenth St., N. W., Washington, D. C., 35 cents a copy), 45(3), pp. 120-121, 124, 5 photos.

Wilt disease, first reported from Tennessee, is now known also from 5 other southern states. The most striking symptoms are wilting and yellowing of the leaves and the formation of fine brownish-black streaks in 5-6 outer annual rings of the trunk. The causal organism is an unidentified species of Cephalosporium; its spores are readily carried by the wind. The susceptibility of different species of persimmon is discussed. Persimmon is useful in erosion control due to its ability to pioneer on certain worn-out soils. Its fruit furnishes a considerable food supply for wildlife. Pages 122-123, enclosed by this article, contain an illustrated general account of the persimmon by G. H. Collingwood, who also refers to the value of the fruit to wildlife.

Diseases and Parasites: Rabies

Guilford, H. M. Rabies prevalent, Wisconsin Conservation Bul. (Dept. of Conservation, Madison, Wis.), 3(11), Nov. 1938, pp. 30-31.

A number of foxes and skunks from the southwestern part of Wisconsin have been found infected with rabies. Popular account of the disease and suggestions for avoidance and treatment.

Diseases and Parasites: Sarcocystis

Gower, Carl. A new host and locality record for Sarcocystis rileyi (Stiles 1893), Journ. Parasitology (Science Press, Lancaster, Pa.), 25(4), Aug. 1938, p. 378.

Black duck, Michigan. Notes on previous reports and results of autopsies.

Diseases and Parasites: Shock disease

Green, R. G., and C. L. Larson. A description of shock disease in the snowshoe hare, Amer. Journ. Hygiene (Prince and Lemon Sts., Lancaster, Pa.), 28(2), Sept. 1938, pp. 190-212, 1 pl., 3 tables.

Reference to cycles particularly that of the hare with note on discovery of shock disease and reasons for the name. Description of the investigation and of the disease, its recognition, symptoms, and pathology. Authors' conclusions: "While our present knowledge of shock disease is inadequate, it seems sufficient, in relation to our systematic investigation, to permit the conclusion that this disease is truly the mechanism of the periodic decimation of hares. x x x We have definite evidence to show that shock disease is caused by local conditions and also evidence that the causal factors are associated with the immediate environment, probably the ground itself. At this time investigations on the causative factor indicate that an assumption that some toxic agent, associated with a parasite, might cause the disease is not unreasonable. A roundworm undergoing developmental stages in the lung tissue might be the source of a toxic agent which could produce such a derangement as we describe in shock disease. Other endoparasites, ectoparasites, and synthalin, which is derived from food plants must, however, be considered among the possible sources of shock disease.

"During the periodic decimation of the snowshoe hare population in the northern hemisphere, hares apparently in full health suddenly develop grave

symptoms and expire. Brought under conditions of captivity during the sharp period of decline, most hares succumb within a few days. We have come to refer to this condition as shock disease, as the symptoms and death are stimulated to appear by the stress of trapping or captivity, and the symptoms are generally due to hypoglycemic shock. The basis of the hypoglycemia has been discovered to be liver damage and resultant failure of glycogen storage. Shock disease has been found widespread in snowshoe hares in Minnesota during several years previous to and following 1936. The fact that deaths of hares from shock disease have been observed under natural conditions indicates that deaths in captivity are but an exaggeration of the occurrence and mortality of this disease in nature."

Diseases and Parasites: Sickle-cell anemia

Dougherty, R. W. Sickle cells in the blood of western deer, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 3(1), Jan. 1939, pp. 17-18.

Author's abstract: "Sickle-cell anemia in a black-tailed deer was first found in Oregon during the summer of 1938. Further investigation revealed that the condition was present in all the black-tailed deer available but not in mule deer or in a black-tailed X mule deer cross. Wright's stain, moist cover slip preparations, and supra-vital techniques were used in making the blood examinations."

Diseases and Parasites: Sickle-cell anemia

Whitlock, S. C. Studies on the blood of white-tailed deer, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 3(1), Jan. 1939, pp. 14-16.

Author's abstract: "The red blood cells of some white-tailed deer exhibit morphological changes that have been compared to the sickling phenomenon of human erythrocytes in sickle-cell anemia. The process was found to be similar but not identical. No pathological changes were found which could be correlated with the condition. Cell counts, hemoglobin determinations, serum analysis for calcium, phosphorus, and magnesium, tissue examination, weekly weight changes, and daily food consumption were used as means of investigation. Observations were made on twenty captive animals and sixty autopsies were performed in studying the situation. The change in cell morphology is looked upon more as a physiologic characteristic of deer erythrocytes rather than an evidence of disease."

Diseases and Parasites: Of starling

Cannon, D. G. On the parasites of the small intestine of the European starling (Sturnus vulgaris) in Quebec, Canadian Field-Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada, 25 cents a copy), 53(3), March 1939, pp. 40-42.

Records from the literature of which 9 titles are cited. Notes on examination of Canadian specimens which yielded 2 kinds of cestodes and one nematode the latter described as a new variety, Capillaria columbae var. sturni.

Diseases and Parasites: Tapeworms in rabbits

Whitlock, S. C., and Carl Gower. Tapeworms in rabbits, Michigan Conservation (Dept. of Conservation, Lansing, Mich.), 8(2), Oct. 1938, p. 8.

"Blisters" in the body cavity of a rabbit contain larval stages of a tapeworm of dogs. Cottontails in the Lower Peninsula are 75% infected. They do not spoil the rabbits for human food but feeding carcasses or entrails raw to dogs is largely responsible for the great prevalence of the worm.

Diseases and Parasites: Ticks

Philip, Cornelius B. Ticks as vectors of animal diseases, Canadian Entomologist (Guelph, Ontario, Canada), 71(3), March 1939, pp. 55-65, tables.

Discussion of tick habits, distribution, and hosts and their role in disease transmission, with lists of the pathogens naturally or experimentally carried by ticks, and tick-borne diseases in all the continents. For North America there are 10, half of which are known to affect wildlife.

Diseases and Parasites: Trematodes

Paul, Allard A. Life history studies of North American fresh-water polystomes, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(6), Dec. 1938, pp. 489-510, 3 pls., 1 table.

Review of literature of monogenetic trematodes with description and illustrations of a new subspecies from tree frogs (Hyla) and of a new species from a terrapin (Chrysemys) and notes on their life histories. Bibliography of 32 titles.

Diseases and Parasites: Trematodes of Anatidae

Cannon, D. G. Some trematode parasites of ducks and geese in eastern Canada, Canadian Journ. Research (National Research Council, Ottawa, Canada, 25 cents a copy), 16-Section C-9, Sept. 1938, pp. 268-279, 9 figs., 1 table.

Distributional notes, descriptive details, and illustrations of 8 species, two recorded from America for the first time, and one described as new. This is Stephanoprora mergi from the American merganser. Bibliography of 18 titles.

Diseases and Parasites: Trematodes of ducks

Gower, W. Carl. Studies on the trematode parasites of ducks of Michigan with special reference to the mallard, Agri. Expt. Sta., Michigan State College (East Lansing, Mich.), Memoir 3, 94 pp., 2 pls., 1 fig. June 1938.

Notes on the scope of the work and methods used. There are accounts of the genera and species identified in Michigan, each including history, names of hosts, and descriptive details. There is a key to 9 species of Maritrema and descriptions of novelties including Amphimerus elongatus n. sp., Maritrema nettae n. sp., and Leucochloridiomorpha macrocotyle n. g. and sp. A key is presented to the genera of trematodes known from ducks, as well as diagnoses of families and genera, and an annotated check list of the species. There is also a list of duck trematodes by hosts, a bibliography of 189 titles, and an index.

Diseases and Parasites: Trematodes, Reniferinae

Byrd, Elon E., and J. Fred Denton. New trematodes of the subfamily Reniferinae, with a discussion of the systematics of the genera and species assigned to the subfamily group, Journ. Parasitology (Science Press, Lancaster, Pa.), 24(5), Oct. 1938, pp. 379-401, 17 figs.

History, diagnosis, and key to 8 genera of these snake parasites, 2 new. Keys to species of all the genera, of which 7 are described as new. Discussion, phylogeny, illustrations, and bibliography of 11 titles.

Diseases and Parasites: Tularemia a bar to importation of rabbits

Whitlock, S. C. Danger of spreading tularemia one good reason against importation of rabbits for restocking purposes, Michigan Conservation (Dept. of Conservation, Lansing, Mich.), 8(6), Feb. 1939, pp. 5, 7.

In Michigan tularemia is known to affect, among other species, the ruffed grouse, cottontail rabbit, snowshoe hare, and man, the last-named being among the most susceptible. While tularemia is known to be a serious disease of cottontails in some localities, it is not known to have been epidemic in Michigan. Of 50 human cases reported from 1935-38, "a considerable percentage" were traceable to rabbits shipped into the State from the west. Although the risk of infection is slight, suggestions are given as to avoiding the handling of light, out-of-condition, or sickly rabbits. Symptoms of the disease in man are described and instructions given for victims. The danger of increasing the incidence of tularemia among Michigan rabbits is one of the strongest arguments against importation of cottontails. Alarming outbreaks of human tularemia in Illinois and Missouri in 1938 are referred to and the statement made that Michigan State Departments of Health, Agriculture, and Conservation "have taken a stand against importing rabbits for restocking purposes."

Diseases and Parasites: Of wild animals

Cameron, Thomas W. M. Animal parasites of wild animals, XIIIth International Veterinary Congress (Zurich-Interlaken, Switzerland), 8(1), 1938, pp. 13-22.

While a very high percentage of wild animals harbor parasites, resultant disease, which depends on massive infestation, is the exception rather than the rule. Localization and concentration of animals are important factors in building up parasite populations. This occurs rather rarely in nature but more frequently under conditions created by man. Effects noted in zoological gardens,

on fur and game farms, at fish hatcheries, and in wildlife reservations are discussed. A few parasites known to be of importance in the wild are named. Transfer of parasites from wild to domestic animals and to man is exemplified. The need for research and surveys is emphasized and technique adopted by the Institute of Parasitology in Canada described.

Ecology: Biologic balance, agriculture in relation to

Holt, Ernest G. What is a biologically balanced farm?, Soil Conservation (Supt. of Documents, Washington, D. C., 10 cents a copy), 4(9), March 1939, pp. 206-208, 2 figs.

Discussion of biologic balance, always a fluctuating one, that has been greatly disturbed by the activities of civilized man. Humans do not like to take the blame, so complain of rodent destruction of the range when livestock overgrazing is the real cause of the trouble. Isolated farms are more subject to damage by wildlife than those in blocks including little natural environment. On the other hand clean farming eliminates wildlife and deprives the farmer of its services in reducing insect pests. It also brings on erosion that may ruin the land. Some sort of return to biologic balance may be achieved by compensating for the necessarily destructive processes of farming by constructive and protective measures. These may combine erosion control and improved wildlife conservation with production of a reasonable volume of agricultural crops and upbuilding of soil fertility.

Ecology: Biologic balance, hedges in relation to

Enlow, C. R. Hedges conserve soil and wildlife, Soil Conservation (Supt. of Documents, Washington, D. C., 10 cents a copy), 4(9), March 1939, pp. 209, 223.

Hedges in France and Great Britain encourage a heavy population of small birds. These growths serve also as fences and help to control erosion; they should be planted on contours. "It has been stated that hedges harbor insects that attack crops. This may be true in some instances; but it must be admitted that they furnish protection for birds and predacious insects that feed on many insect pests. It seems to me that the planting of hedges within the limits of practicability and common sense would be a step toward restoring nature's balance on agricultural lands."

Ecology: Biotic districts of Oklahoma

Blair, W. F., and T. H. Hubbell. The biotic districts of Oklahoma, American Midland Naturalist (Notre Dame, Indiana, $1.00 a copy), 20(2), Sept. 1938, pp. 425-454, 1 map, 1 table.

Description of biotic districts and their plant associations together with lists of their orthoptera and mammals. Zonation is predominantly east-west indicating that precipitation, not temperature, is the most important controlling factor.

Ecology: Census of California sea lions

Bonnot, Paul, G. H. Clark, and S. Ross Hatton. California sea lion census for 1938, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 24(4), Oct. 1938, pp. 415-419, fig. 140, 3 tables.

Report on 5 surveys made from 1927 to 1938, inclusive. Although commercial and sporting interests claim that a great increase in the animals has occurrred in recent years, the claim is not supported by the censuses. Present law gives the animals complete protection and no evidence of systematic violations was found. Tables present the details of counts by localities and for 2 species of sea lions. "The California sea lion population is not increasing. The depredations of the animals are nowhere as extensive as is claimed, and for the present there seems to be no reason to reduce their numbers."

Ecology: Census methods

Green, R. G., et al. Grouse populations, Minnesota Wildlife Disease Investigation (Dept. of Bacteriology, University of Minnesota, Minneapolis), Oct. 1938, pp. 74-76, 2 figs., 1 table, mimeographed.

Description of the strip-walking method and 2 patterns followed (these are figured) together with explanation and sample of the formula used in calculating populations. Tabulation and discussion of results for 7 years. Implausible variations in results led to careful consideration of the entire situation and to the conclusion "that, on areas which are not homogeneous in topography and cover, the strip-walking method of consusing has no advantage over mere observation by a trained field-man, and that a numerical designation assigned to the population on a basis of the strip-walking method implies an accuracy that cannot be justified."

Ecology: Census methods, elk

La Noue, Francis D. Census of the Yellowstone elk herd, University of Idaho (Moscow), Bul. 33(22), Dec. 1938, pp. 42-43.

"Factors conducive to accuracy in a count are: (1) Favorable weather; (2) a concentration on the winter range; (3) an ample number of experienced observers who know the country; (4) a sharply defined organization of the ground." Each observer is assigned a definite area; all are assembled before the count and the plan discussed as well as afterwards to bring out any possible duplicationsor misses that may have occurred.

Ecology: Census methods, fur animals

Hamerstrom, F. N., Jr., and James Blake. A fur study technique, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 3(1), Jan. 1939, pp. 54-59, 2 figs.

Authors' abstract: "The method, designed for ditch- and stream-dwelling furbearers on a 100,000 acre area in central Wisconsin, consisted of repeated surveys. Fur sign was mapped, by species, by the use of symbols (reproduced in

the paper). Notes on animals seen, mortality, foods, water levels, etc., were taken. Field maps were transferred to large-scale base maps for permanent record. The 200 miles of ditches and streams were covered by two crews of two men each in 17 days.

"Five surveys were made between May 1936 and August 1937. The survey data, summarized in the paper, showed where the animals were at different seasons, exactly where range improvement was necessary, where not needed, where impracticable, and what factors needed to be manipulated; where refuges should be placed. On an area too large to census and lacking kill records, abundance and distribution of sign can be used in empirical regulation of trapping. Suggestion: censuses of sample areas of heavy, medium, and light sign could be applied to the mileage of inhabited shore shown on maps to give a more accurate population figure than the general estimates so often used."

Ecology: Check-areas

Hanson, Herbert C. Check-areas as controls in land use, Scientific Monthly (Lancaster, Pa., 50 cents a copy), 48(2), Feb. 1939, pp. 130-146, 14 photos.

Suggests the extension to land use problems of the well known essential in scientific experimentation--controls. In this domain these would be suitable tracts of land and their employment is necessary if land utilization is to be based as fully as possible upon science. Relations of animals to soils are discussed and there is a section on "Control of rodents and carnivores" in which the suggestion is made that "attempted eradication should be delayed until accurate information is secured." The importance of check-areas is emphasized for all biological problems.

Ecology: Clearings

Lay, Daniel W. How valuable are woodland clearings to birdlife?, Wilson Bul. (Dr. J. Van Tyne, University Museums, Ann Arbor, Mich., 60 cents a copy), 50(4), Dec. 1938, pp. 254-256, 1 table.

Author's summary: "(1) Thirty-minute time unit bird counts are useful for expressing the relative abundance of birds in two or more types; (2) an average thirty-minute walk in the margin of a Walker County, Texas, pine woodland clearing may be expected to disclose 16 or 17 birds of 6 or 7 species. A similar walk in the interior of woodland more than 100 yards from the edge of a clearing discloses 8 or 9 birds of 4 or 5 species; (3) the margins of clearings have 95 per cent more birds representing 41 per cent more species than the interiors of corresponding woodland; (4) in the management of pine woodland the provision of well scattered, small (less-than-thirty-acre) clearings is distinctly favorable to birdlife."

Ecology: Cover preferences of pheasants

Leedy, Daniel L. Cover and its relation to pheasant production in Wood County, Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus) Release 86, 6 pp., 1 fig., 4 tables, mimeographed, April 1, 1938.

Observations made 1936-1938; "93% of the area is in farms; less than 1% in unpastured woodland, and only 6.1% in woodland (pastured and unpastured); the cover largely consists of cultivated crops and is subject to continuous alterations due to farming operations." A survey made in 1937 indicated a 31% mortality of hen pheasants from mowing in hayfields. Utilization of the different kinds of cover by seasons is described, tabulated, and graphed. Woods are used most in winter, least in summer, and more by cocks than by hens. Woods, weeds, and grass, and corn are frequented more than stubble, hay, soybeans, oats, and wheat.

Ecology: Deer, Idaho

Mass, Fred H. The deer situation in northern Idaho, University of Idaho (Moscow) Bul, 33(22), Dec. 1938, pp. 30-34, 1 table.

Mule deer about 50 percent of the entire population inhabit high elevations of rugged topography, while the whitetails live on more gentle slopes in heavy cover. Winter range is at present adequate. Agents contributing to natural losses, in the order of their apparent importance, are: Predatory animals, parasites, old age, disease, and accidents. "Light" control of predators is practiced. There are notes on hunting and estimates of the deer population which seems to be steadily increasing.

Ecology: Drainage

Kenney, F. R., and W. L. McAtee. The problem: Drained areas and wildlife habitats, U. S. Dept. Agriculture Yearbook 1938, pp. 77-83, 2 figs. Separate No. 1611, Jan. 1939, 8 pp., 2 figs. (So long as the supply lasts, copies may be obtained free from the Biological Survey, Washington, D. C.)

Statistics and comment on drainage in relation to man by the first author and discussion of its wildlife relationships by the second. (An arbitrarily mixed, not a truly collaborated, article.) The value of areas efficiently producing some wildlife resource often is not realized until too late--after they are destroyed. Particularly is this true of drainage projects where probable injurious effects either to wildlife or man are rarely forecast or even thought of. The creation of farm fishponds and easement refuges in numbers, however, indicates a change both in sentiment and practice. Description of important restoration projects in the Federal migratory bird refuge program. There is comment also on upland wildlife restoration.

Ecology: Effects of drouth on Microtus

Wooster, L. D. The effects of drouth on rodent populations, Turtox News (General Biological Supply House, Inc., 761-763 East 69th Place, Chicago, Ill.), 17(1), Jan. 1939, pp. 26-27, 1 fig., 1 table.

During a drouth period (1933-37) meadow mice practically disappeared from the vicinity of Hays, Kansas. Measured in frequency of occurrence in barn owl pellets (numbers not stated) examined at the beginning and during the drouth, meadow mice dropped from 15 to 1. Pocket mice and harvest mice were chiefly seized upon by the owls to make up the deficit. The tabulation shows food items and their number of occurrences in pellets collected in 1933 and 1935.

Ecology: Elk-deer competition

Caso, George. The influence of elk on deer populations, University of Idaho (Moscow) Bul. 33(22), Dec. 1938, pp. 25-27.

"Originally, when the number of elk was small, the deer occupied the areas of lesser snow depths on favorable exposures, and the elk stayed in sizeable bands higher up the same exposure where the snow was from 1 to 2 feet deeper. As the elk increased in numbers, they pushed back to maximum snow depths and also encroached on normal deer winter range. Here the elk, being the larger and stronger animals, were able to reach higher and paw deeper snow to obtain adequate food. When the numbers of the two animals reached the point where food became scarce, then the deer were the first to feel the pinch of undernourishment." Evidence is presented of the perishing of deer under these conditions, which also increase their vulnerability to predation.

Ecology: Fur animals

Kelker, George H. The relationship of fur-bearers to other wildlife, University of Idaho (Moscow) Bul. 33(22), Dec. 1938, pp. 80-82.

Ecological relationships, particularly in food-chains.

Ecology: Mammals, Oklahoma

Blair, W. Frank. Ecological relationships of the mammals of the Bird Creek region, northeastern Oklahoma, American Midland Naturalist (Notre Dame, Indiana, $1.00 a copy), 20(3), Nov. 1938, pp. 473-526, 12 figs., 3 tables.

Description of the region and its ecological associations; annotated list of mammals; effects of drought; and population studies. "There is a tendency for the species that extend beyond the limits of their respective association types to be modified [generally to a sufficient extent to] form the basis for the recognition of subspecies." Bibliography of 22 titles.

Ecology: Mosquito control operations

Bradley, G. H. A consideration of some phases of the mosquito control problem, Journ. Economic Entomology (E. N. Cory, College Park, Md., 75 cents a copy), 32(1), Feb. 1939, pp. 110-112.

The phases discussed are those related to wildlife conservation and restoration. Stressing that salt-marshes vary greatly in character, the author says: "In discussing mosquito control, persons antagonistic to the work usually stress conditions on those marshes where the effect of ditching on wildlife habitats is most severe, and imply that such conditions are universal, whereas if such persons have any knowledge of marsh conditions in general they must know that such implications are misleading. However, there is no question but that undesirable changes do occur on many marshes following ditching, and for this reason mosquito control should be justified on the basis of the actual relief from mosquitoes and not on the lack of injury to marsh conditions or their

incidental improvement in certain cases as a result of the work."

Where benefits do not clearly outweigh disadvantages, mosquito control should not be undertaken. Careful record should be made of conditions before, during, and after treatment so that the work may be discussed on a basis better than faulty memories. Mosquito control is a biological problem and should be under direction of men with training fitting them to understand the ecological problems involved. Cooperation of wildlife authorities should be sought in connection with both preliminary surveys and operating plans. "This does not mean that, when a community has decided for mosquito control, it should be necessary to have the project approved by sportsmen's associations before work is started." Mosquito control officials do not desire to interfere needlessly with wildlife, and in Maryland, Delaware, and New Jersey are recommending "that no permanent marsh pond be ditched unless a considerable mosquito breeding area is affected by it," and then only by a spur ditch, that can be closed later if conditions warrant. Remedial measures are being applied also to ponds previously drained. The marshes so treated are improved for muskrat production.

"Mosquito-control men in New York, Rhode Island, Connecticut and various other states are now endeavoring to carry on their work in a manner that will affect wildlife on the marshes to the least extent possible. x x x It is believed by many conservationists familiar with marsh conditions that these marsh areas can be maintained without the sacrifice of essential and justifiable mosquito control correctly conducted. x x x The rapidly growing interest in conservation and rehabilitation of wildlife feeding and breeding areas, however, demands that attention be given by mosquito control officials to this problem. On the other hand, there is a danger of producing serious mosquito problems by water impoundments for wildlife habitats and for erosion and flood control, and persons in charge of such projects should likewise give careful attention to the mosquito hazard involved in their work."

Ecology: Mosquito control operations

Glasgow, Robert D. Mosquitoes and wild life as interrelated problems in human ecology, New York State Mus. Bul. (Albany, N. Y.). 316, Sept. 1938, pp. 7-20.

Discussion of the problem especially as involved in the enormous emergency employment campaigns. Wildlife is referred to in paragraphs on draining and filling, oil and larvicide, biological control, salt marsh ditching, upland control an urban problem, and in a section on wildlife conservation. "Mosquito control and wild life conservation have largely been developed, each without reference to the other, as if they were wholly unrelated interests," but "constitute a group of problems that can be solved only by careful scientific study; not by partisan dispute."

Ecology: Mosquito control operations

Taylor, Norman. A preliminary report on the salt marsh vegetation of Long Island, New York, New York State Mus. Bul. (Albany, N. Y.) 316, Sept. 1938, pp. 21-84, 18 figs., 1 map.

Complete form of paper noticed in WILDLIFE REVIEW No. 15, July 1938, p. 12. The bulk of the account is descriptive of the marshes and their ecology with special reference to depth of the water table below the surface and to salinity under the marsh. In discussing mosquito control, the author makes a distinction between the drainage of fresh water environments (which he deplores) and the ditching of salt marshes. The ditching is described and its physical and chemical effects appraised. The author's conclusions are:

"1. Ditching has made no fundamental change in the makeup of the salt marsh vegetation because ditching has not changed materially an environment predicated upon a very constant factor--the character and level of the salt water under the marsh.

"2. The undoubted changes that have come along the edges of the ditches appear to be due to conditions of aeration, freedom from competition and the changes in the hydrogen-ion concentration of the peat stacked up along the ditches. Such changes affect only plants of secondary successional significance, and the effects of such changes are about as important as the edging along a perennial garden border, the contents of which may be permanent, while the edging like that along the ditches, may be changed from season to season. The only exception to this is marsh elder (Iva oraria), which, once it has captured a line of ditch, appears to stay. But there are miles of ditch where marsh elder x x x has not come in, even after nearly 20 years of ditching.

"There is one final caution to be observed in using these data. They apply only to the area studied. Whether ditching areas with a greater tidal range, or of different soils, or with different plants in them would provide similar results is purely speculative. There seems to be some evidence that tides of greater magnitude provide such a different set of conditions from those found on the south shore of Long Island, that ditching in such marshes might well result in very different conclusions than those presented here."

Ecology: Plant indicators

Sampson, Arthur W. Plant indicators--concept and status, Botanical Review (Fordham P. O., New York, N. Y.), 5(3), March 1939, pp. 155-206.

Wildlife managers must appraise vegetation, or in other words, make use of plant indicators; they should be interested in this resume of the subject. The main headings are: The indicator concept; plant guide to land use problems; range indicators; forest and soil indicators; plant indicators and chronology; and conclusions. Excerpts from the latter are: "The consensus x x x is that communities of plants are more reliable indicators than are individual species. x x x At present the grazing indicators are the best understood and the most extensively and successfully used. x x x In the future a broader use of indicator communities and species is likely, but such use is sure to be backed by sounder evidences than it has at this time. Preceding this possible broadened use there must first be more critical study of the growth requirements of both the indicator plant and the economic species; only then will the indicator concept reach its maximum reliance." There is a bibliography of 142 titles.

Ecology: Populations

Bureau of Animal Population (Oxford University, England), Annual Report 1937-38, 36 pp., 1939.

The report includes a general review of the year's work, statement of grants in aid, list of the staff and changes therein, accounts of research, game research, North American wildlife inquiries, and other investigations, list of publications by the staff, and notes on the library and its activities. The introductory discussion, doubtless by the Director (Charles Elton), includes a synopsis of factors to be taken into consideration in population studies, 8 items of which specify stages in life-histories at which censuses may be made, 5 list reproductive elements in population control, and 9, types of mortality. An organization chart is devoted to the structure of population research. The study of vole populations is reported on in some detail as to censuses, both of natural and marked populations, effects of voles on vegetation, development of a laboratory stock of this species, and epidemiology. A good deal of the work on game and other investigations has been reported upon in papers that have already been abstracted in WILDLIFE REVIEW.

Ecology: Populations, brant in California

Moffitt, James. Eighth annual black brant census in California, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 24(4), Oct. 1938, pp. 341-346.

Report for the year and for a series of years beginning with 1931. The 1938 census yielded about an average figure. The results, discussed by areas, seem to be affected by many variables. An accompanying paper by Donald H. Fry, Jr., "Brant census of San Quentin Bay, Lower California" (pp. 347-349, figs. 112-113), gives results for an additional area in Mexico.

Ecology: Survival of nestlings

Hero, Casimir. Marsh bird community study, The Flicker (427 Eighth Ave., S. E., Minneapolis, Minn.), 10(3-4), Dec. 1938, pp. 1-3.

Ecology of a sandfill in Minnesota; general notes and tabulations showing the number of nests and eggs and their fates for red-winged blackbirds, sora and Virginia rails, and song sparrows.

Economics: Fur animals, Texas

Lay, Dan W. Fur resources of eastern Texas, Texas Game, Fish, and Oyster Commission (Austin, Tex.) Bul, 15, 7 pp., Feb. 1939.

Author's summary: "(1) The average income of trappers in a typical county (Walker) in eastern Texas for the fur trapping season 1936-37 was $57.58; (2) the $5,000 to $7,000 fur income of the county goes to the people who need it most. This cash income, received during December and January, keeps many families off relief rolls and has an appreciable effect on trade; (3) populations of raccoon and mink in eastern Texas are fairly high in favorable spots but these

species are becoming increasingly scarce. These high populations suggest that under proper management the fur resources can be maintained; (4) muskrats produced the bulk of the fur income of approximately $200,000 the winter of 1936 in three coastal counties, Jefferson, Chambers, and Orange."

Economics: Insects, mites, and ticks

Hyslop, J. A. Losses occasioned by insects, mites, and ticks in the United States, Bureau of Entomology and Plant Quarantine (U. S. Dept. Agriculture, Washington, D. C.), 57 pp., 13 tables, multilithed, 1938.

Wildlife students frequently have need of estimates of damage by insects. This is the most complete review of the subject that has been published and the figures reached are impressive. The material is presented according to groups of crop plants and their principal pests, and to miscellaneous pests including those of animals. Annual losses chargeable to mosquitoes, for instance, $145,525,000. The grand total for all pests, including control costs, is $1,601,527,000.

Economics: Rabbit, Jack

Saugstad, Stanley. The jack rabbit brings money to North Dakota, North Dakota Agr. Expt. Sta. Bul. (Fargo, N. Dak.) 1(4), March 1939, pp. 8-10.

Fur for use in the felt industry and carcasses for food of animals on fur farms are in considerable demand, bringing to the State annually not less than $100,000. Details of sales in 1936-37 and 1937-38 are tabulated.

Education: Conservation

Caldwell, John C. Taking conservation into the schools, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, 10 cents a copy), 9(10), Jan. 1939, pp. 14-15, 28-29, 3 photos.

Methods used by Tennessee Department of Conservation first in interesting and training teachers and then in extending the work to the schools.

Education: Conservation

Fenton, Carroll Lane. Conservation teaching--a panel discussion, Scientific Monthly (Lancaster, Pa., 50 cents a copy), 48(2), Feb. 1939, pp. 190-191.

Summary of papers on this subject given at the meetings of the American Association for the Advancement of Science and affiliated societies at Richmond, Va., in December 1938. Radio effectively teaches science in the grades. Science education must be planned for its social as well as its cultural values. Compulsory courses in conservation are likely to do more harm than good. They may be squeezed into already crowded schedules and taught by unprepared teachers "Such courses make a bad impression upon students, and that bad impression is

likely to continue into their adult lives. Equally bad is the system by which visiting speakers from sportsmen's organizations lecture to grade school children on conservation. Most of these speakers are hunters, not conservationists; they are interested in destroying rather than saving; they lack thorough understanding of the many phases of conservation and the extent to which these phases interlock." In Tennessee, travelling exhibits and demonstrations carry their message to schools and even to unorganized groups. Each visit is intended, however, to begin a conservation project. Once such a project is begun, there is no need for a law to force the teaching of conservation.

Education: Conservation

Thomas, W. Stephen. How a museum serves conservation, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, 10 cents a copy), 9(10), Jan. 1939, pp. 18-19, 28, 4 photos.

Program of the Academy of Natural Sciences of Philadelphia involving museum exhibits and conducted classes, radio talks, and nature walks.

Education: Extension

Palmer, C. M., Jr. Putting the facts to work, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 27(5), Sept.-Oct. 1938, pp. 84-85.

Outline of lectures and radio talks given by men of the Cooperative Wildlife Research Units in several states. A table summarizes other activities.

Education: 4-H bird clubs

Swenk, M. H. Nebraska 4-H bird club manual, Nebraska Agr. Expt. Sta. (Lincoln), Extension Circ. 5-01-2, 63 pp., 73 figs., 5 tables, Sept. 1938.

Objectives of 4-H bird clubs are stated, and suggestions are given by months of special topics for study and action. Brief accounts and illustrations pave the way toward acquaintance with some 40 species of birds. The tables present data on the food habits of hawks and owls, on migrations of 36 common Nebraska birds, and on bird houses and other devices for attracting birds.

Education: Pheasant management for 4-H clubs

Hill, Russell G. 4-H pheasant propagation and management project, Michigan State College (East Lansing, Mich.), Extension Division, Club Bul. 36, 35 pp., 18 figs., 3 tables, Oct. 1938.

This bulletin opens with a statement of the requirements for a project and suggestions of things to do and what to discuss in meetings for every month. Instructions are given for the care of chicks. Recognition of cover values and the maintenance of cover occupy one section of the publication and means of supplying food, another. In connection with these, one table lists trees, shrubs, and vines, their cover and food values, and soil preferences, while a second is devoted to food patch plants, their value, soil requirements, and

methods of cultivation. Feeding stations also are well discussed and illustrated. Other sections of the work relate to the use of flushing bars, to game census on the farm, fire as a destroyer of wildlife, predators, and harvesting. There is a list of 17 publications recommended to 4-H club members.

Education: For wildlife management

Hosley, N. W., Chairman. Report of the committee on game management with reference to forestry, Journ. Forestry (Mills Bldg., Washington, D. C., 50 cents a copy), 37(2), Feb. 1939, pp. 130-131.

At present one or more game management courses are taught in 23 colleges of which 19 offer graduate instruction. Review of their heterogeneous courses is not a practical method of defining what training for wildlife management should be, so the Committee records its views. In answer to the question, "Is wildlife management comparable to forest management in the sense that it is an art based on a body of classified knowledge, principles, and practices worthy of being set apart from pure vertebrate zoology as a separate entity?," the answer is a unanimous, Yes. The next question was: "Should an appreciation of wildlife management principles be a part of the training of a junior member of the Society" of American Foresters?. Again the answer was wholly affirmative. As to "What part in wildlife management can we expect the man to play who has only undergraduate training," the general feeling was that no very responsible tasks could be given such men and that one year of postgraduate work is likely to be more fruitful than any previous one. [Comment: Like other reports on the subject, this is inclined to forget that we are not yet an entirely collegiate crowd and to ignore the value of self-education and experience. The Committee forgets that our leading practicing wildlife manager and author of the book that first put the subject on a firm foundation in this country, had no college training whatever. Just to rivet this impression, let it be recalled that the Dean of the Graduate School of Johns Hopkins University, one of the foremost institutions of its kind, is no college graduate. The A.B. or its like may mean much or little but what the man can do means everything.]

The Committee protests against the filling of responsible wildlife management positions with untrained men. Forestry, zoology, or land use training are considered good bases for wildlife management education; the approach through applied, rather than research, biology is deemed best. A list is given of courses considered essential to a well-rounded curriculum for training in wildlife management.

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